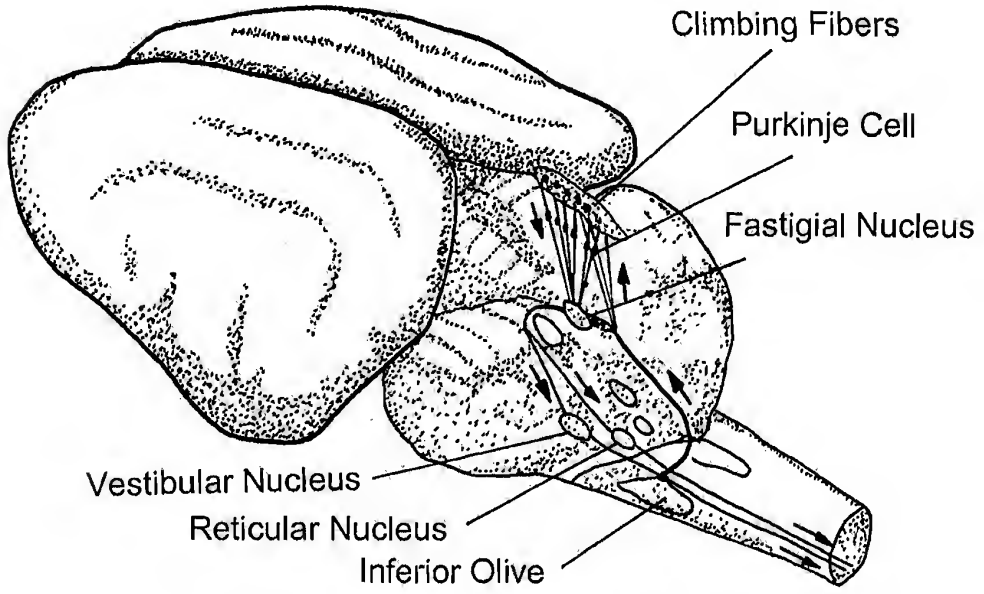
FIG. 1A



Olivo-cerebellar feedback loop

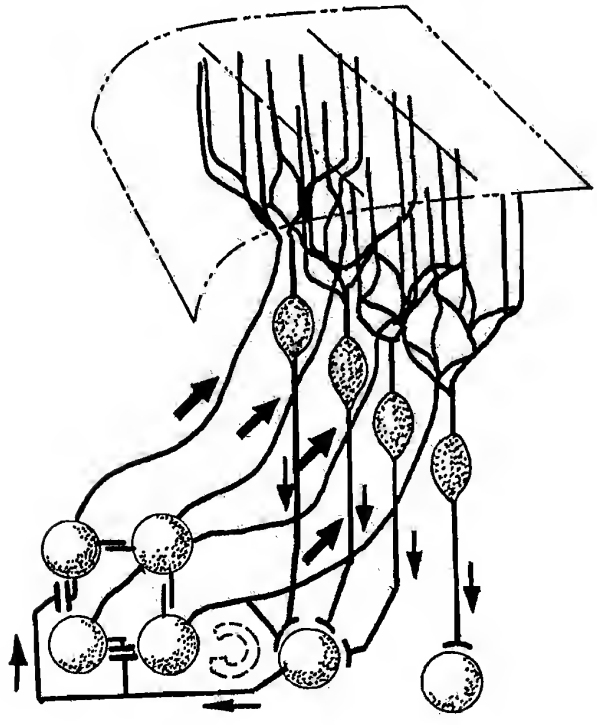


FIG. 1B

Functional circuit

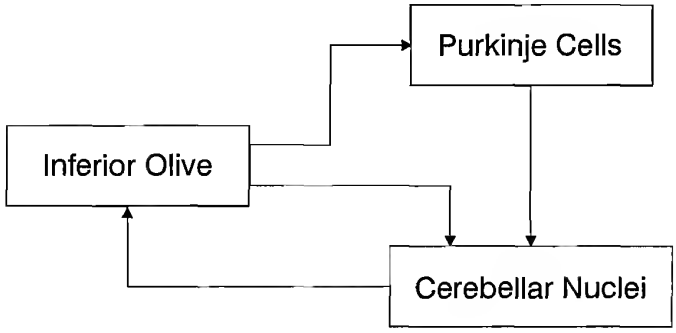
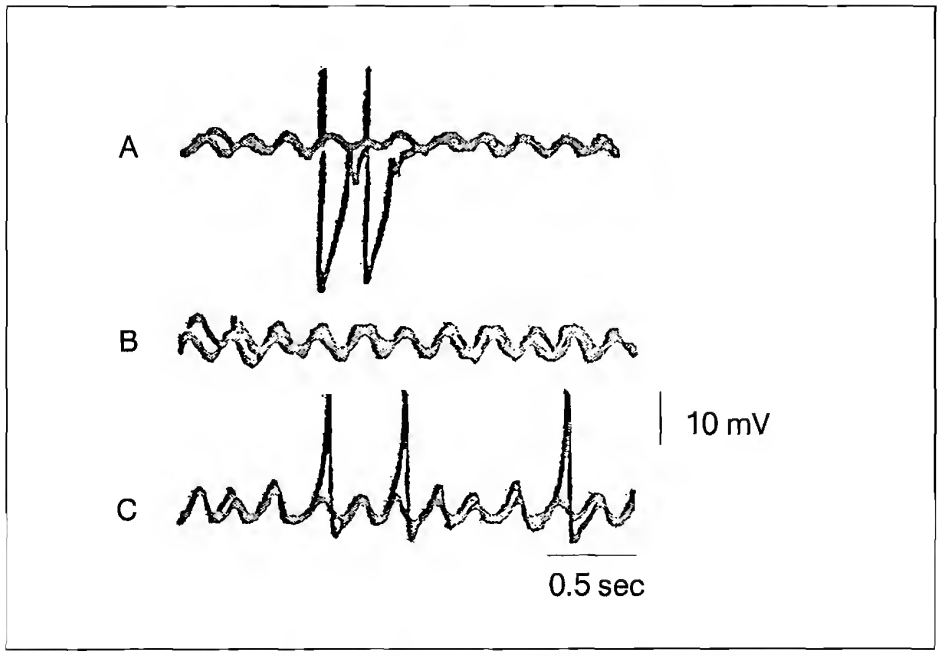


FIG. 1C



ELECTROPHYSIOLOGY OF NEURONES IN OSCILLATION AND RESONANCE 9

FIG. 2

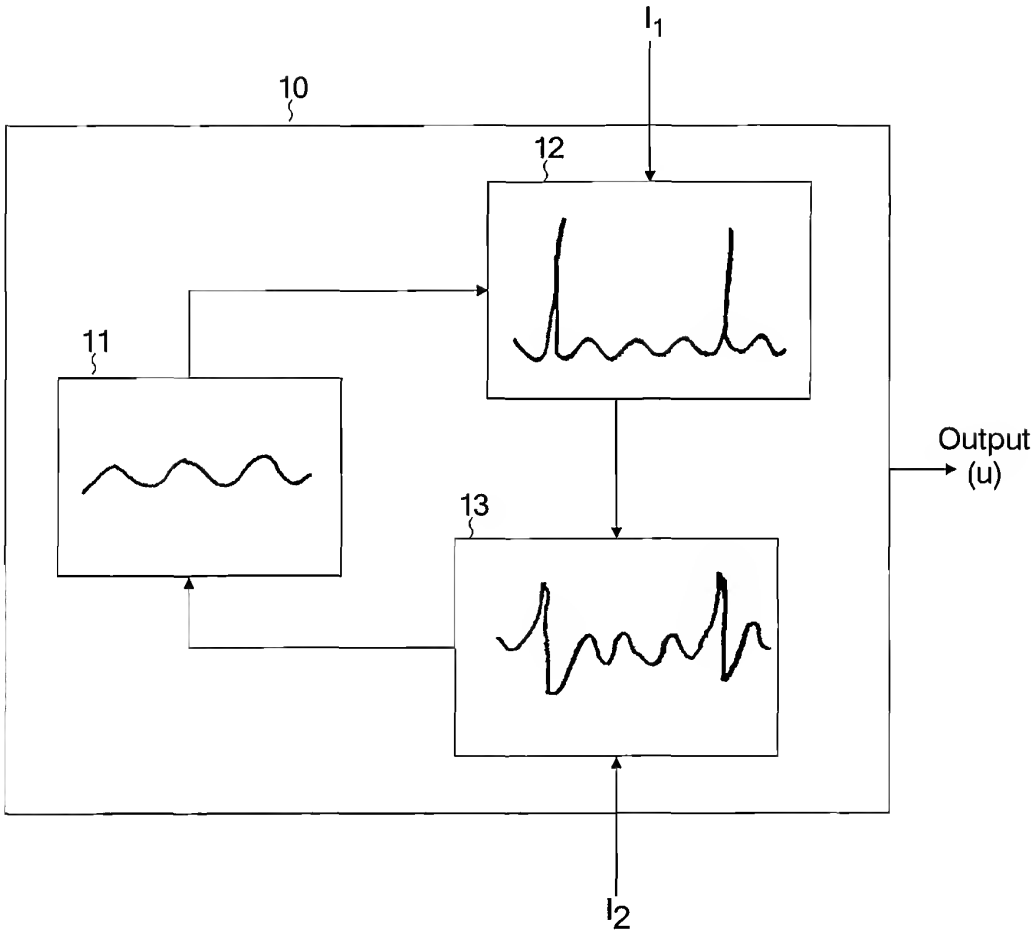


FIG. 3

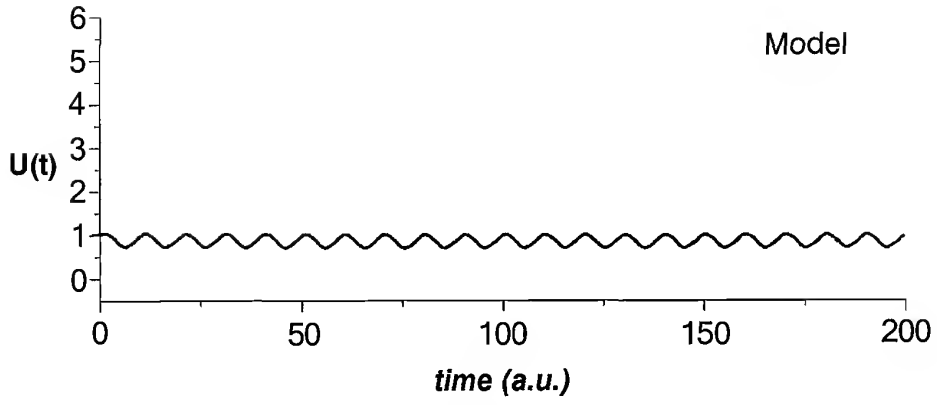


FIG. 4A

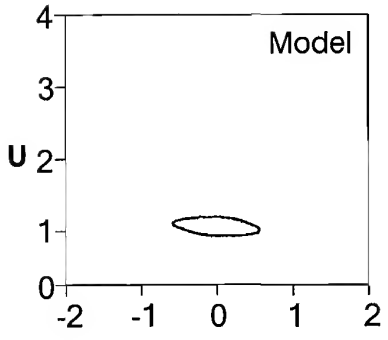


FIG. 4B

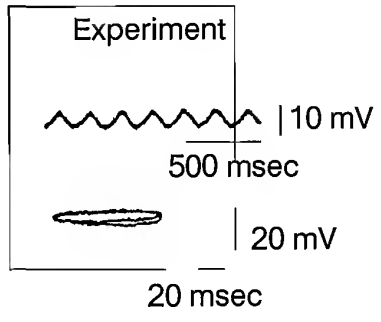


FIG. 4C

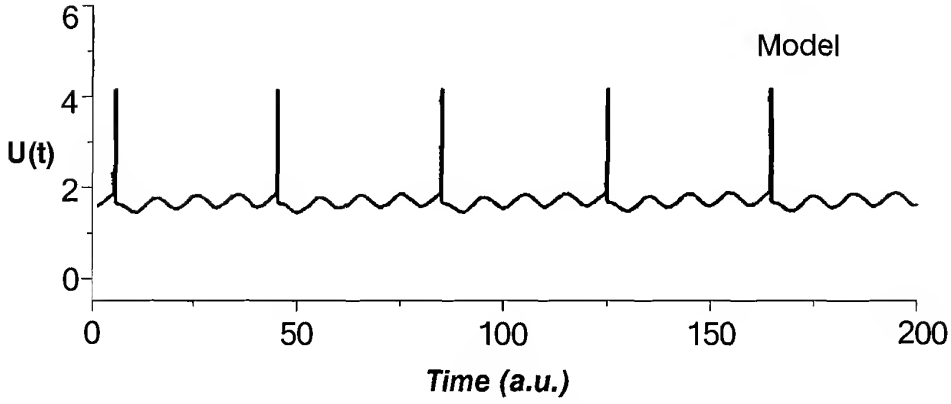


FIG. 5A

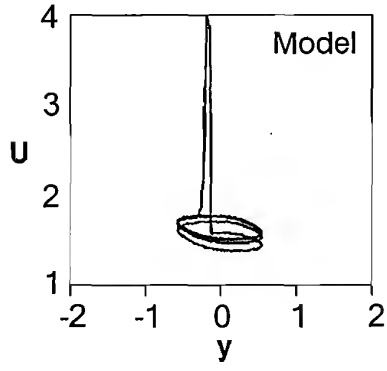


FIG. 5B

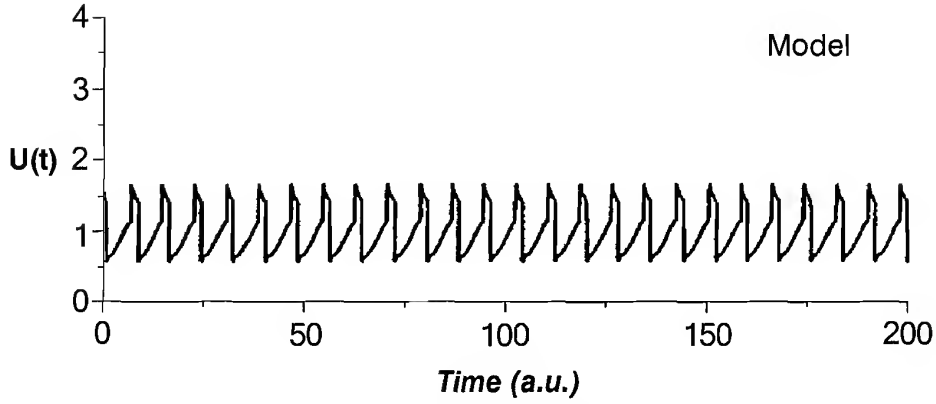


FIG. 6A

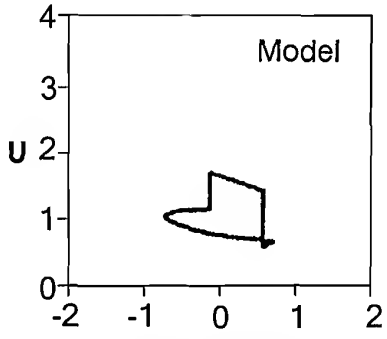


FIG. 6B

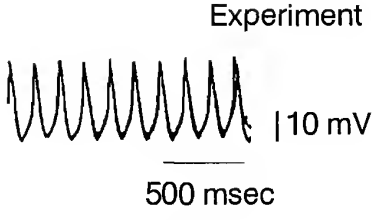


FIG. 6C

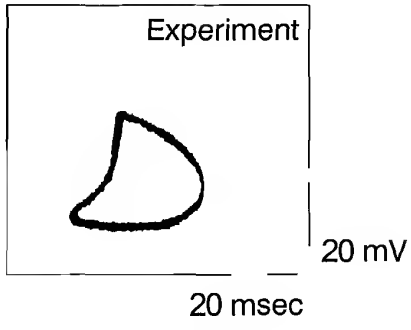


FIG. 6D

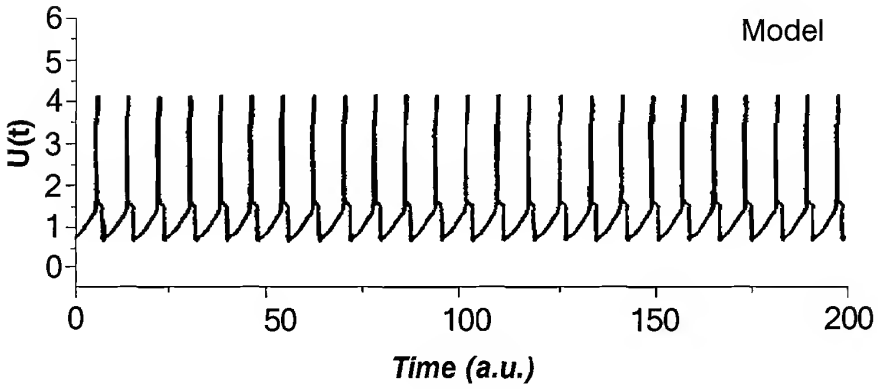


FIG. 7(a)

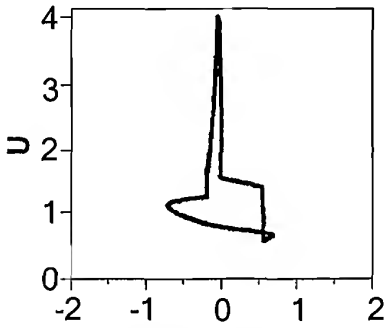


FIG. 7B

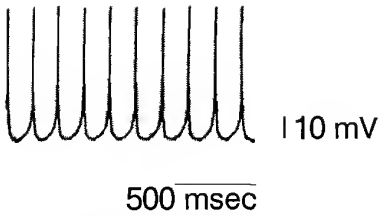


FIG. 7C

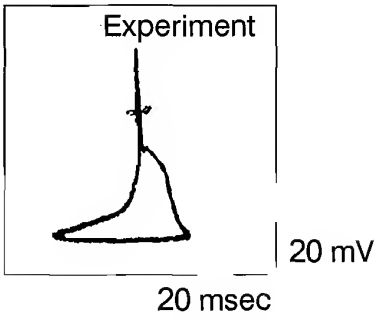


FIG. 7D

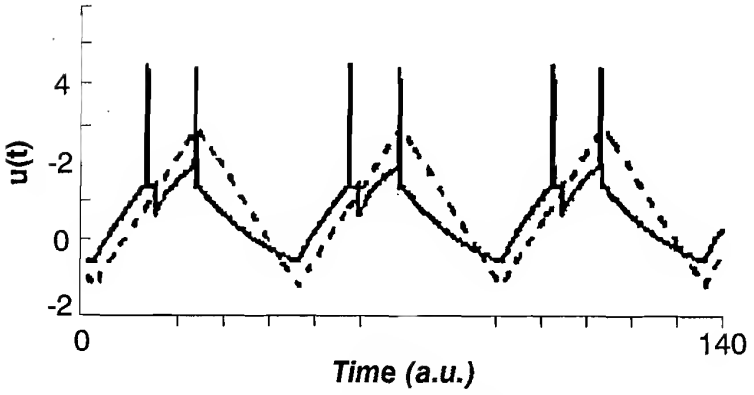


FIG. 8A

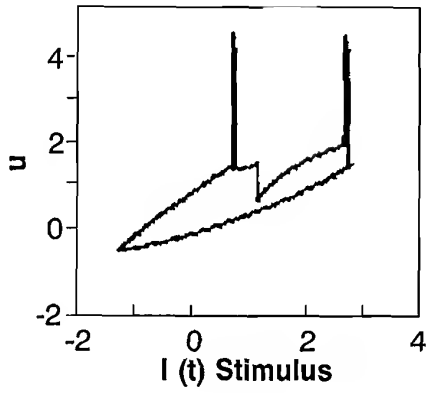


FIG. 8B

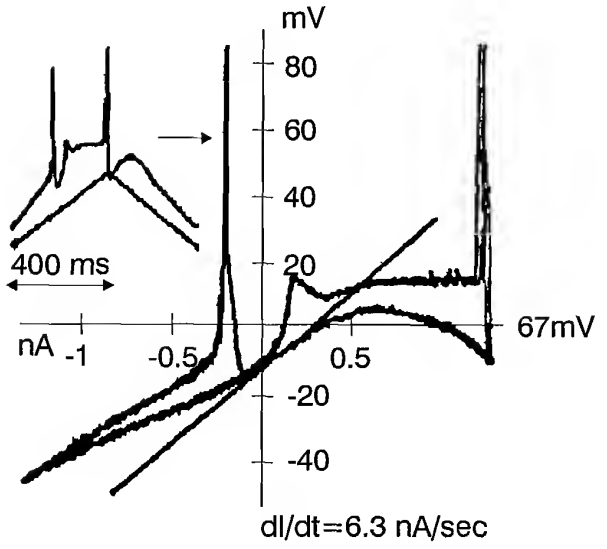


FIG. 8C

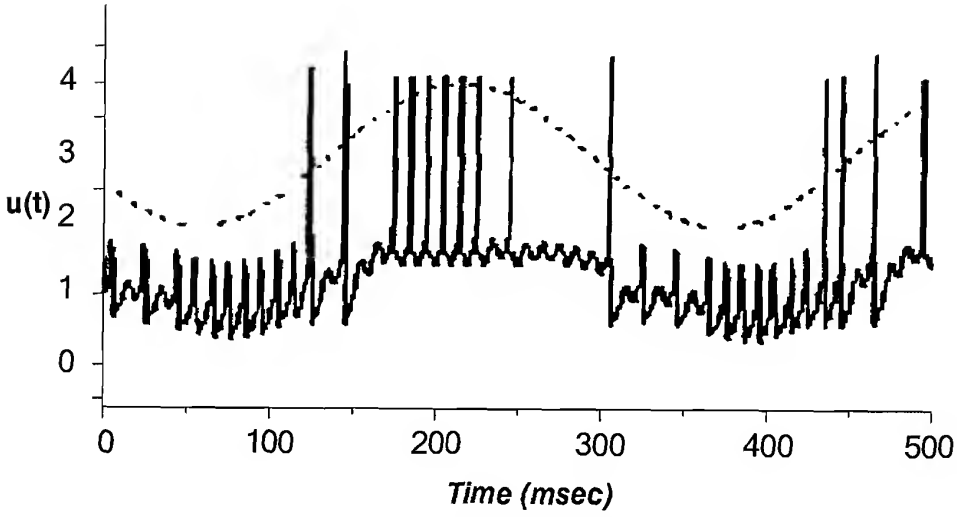

u(t)
4
3
2
1
0
0
100
200
300
400
500
Time (msec)

FIG. 8D

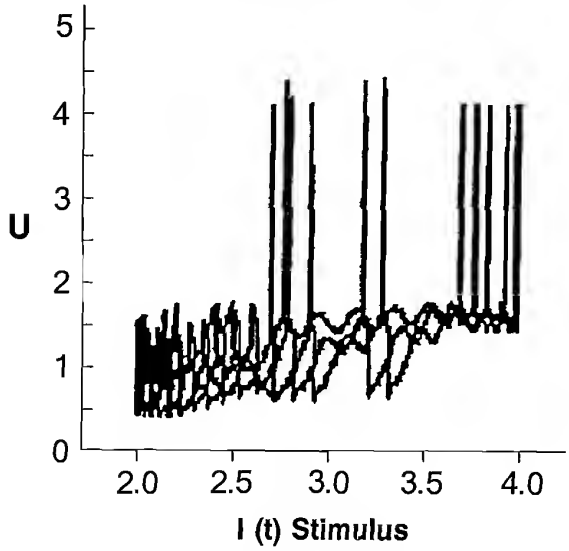

U
5
4
3
2
1
0
2.0
2.5
3.0
3.5
4.0
I (t) Stimulus

FIG. 8E

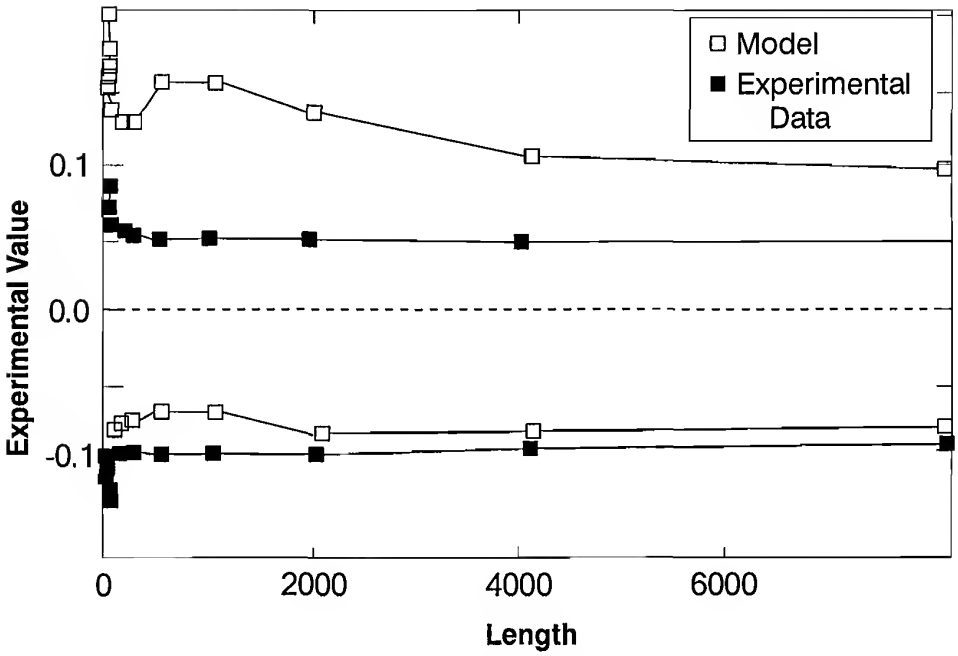
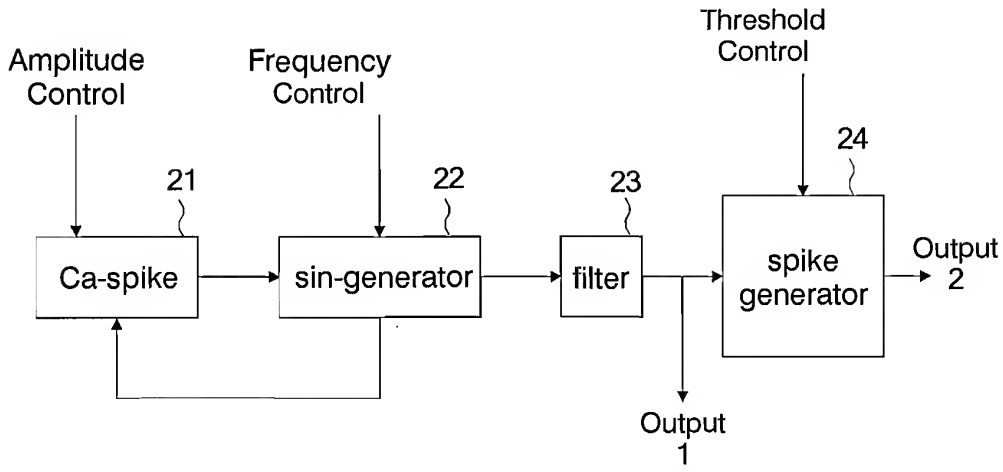


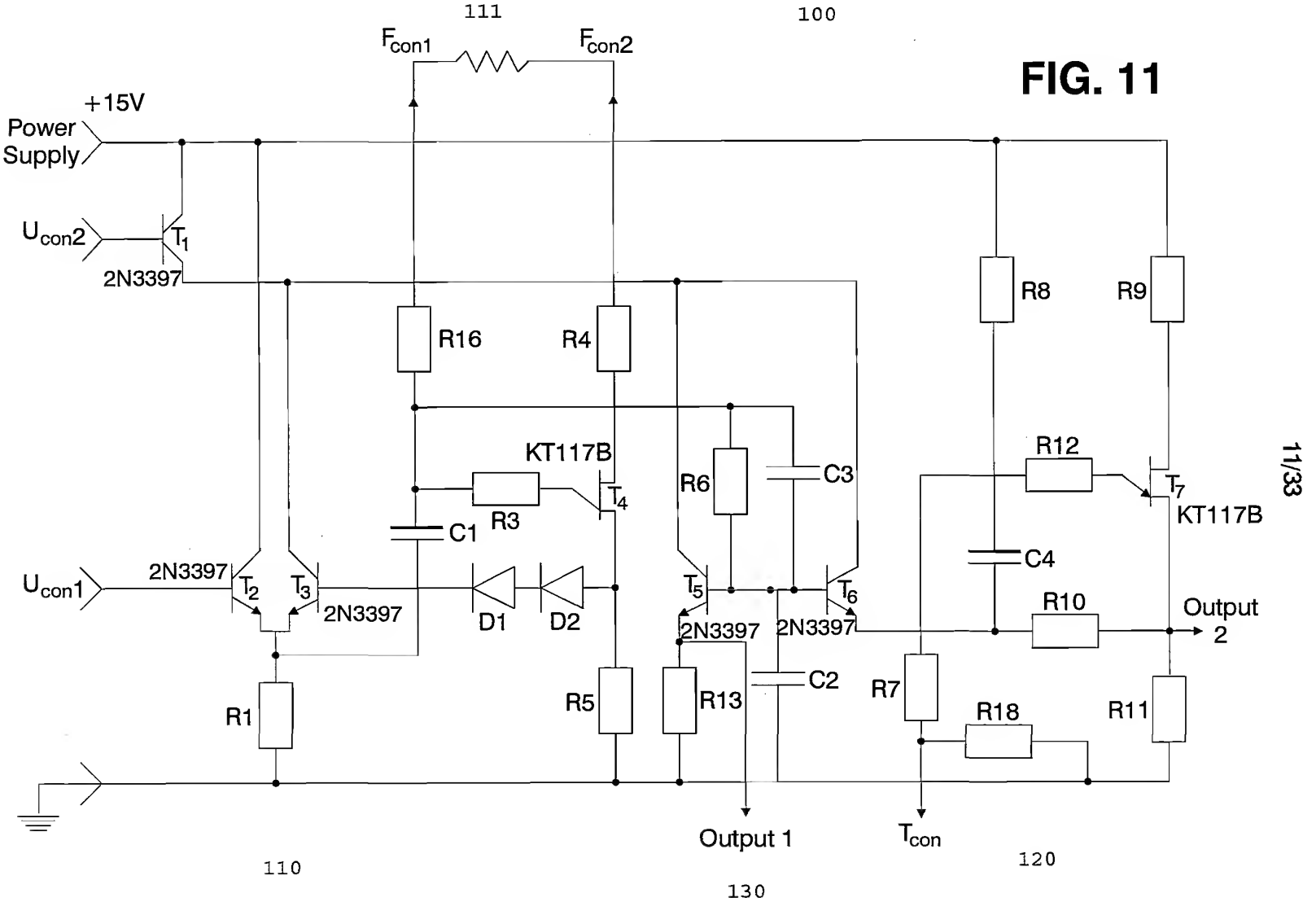
FIG. 9



Block-Diagram of the Circuit

FIG. 10

FIG. 11


111
100
F_{con1}
F_{con2}
+15V
Power Supply
U_{con2}
T_1
2N3397
R16
R4
R8
R9
KT117B
T_4
R3
C1
R6
C3
R12
T_7
KT117B
C4
U_{con1}
2N3397
T_2
T_3
2N3397
D1
D2
T_5
T_6
2N3397
2N3397
R10
Output 2
R1
R5
R13
C2
R7
R18
R11
Output 1
T_{con}
110
130
120

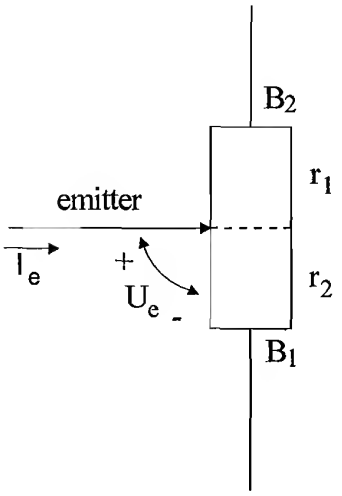


FIG. 12A

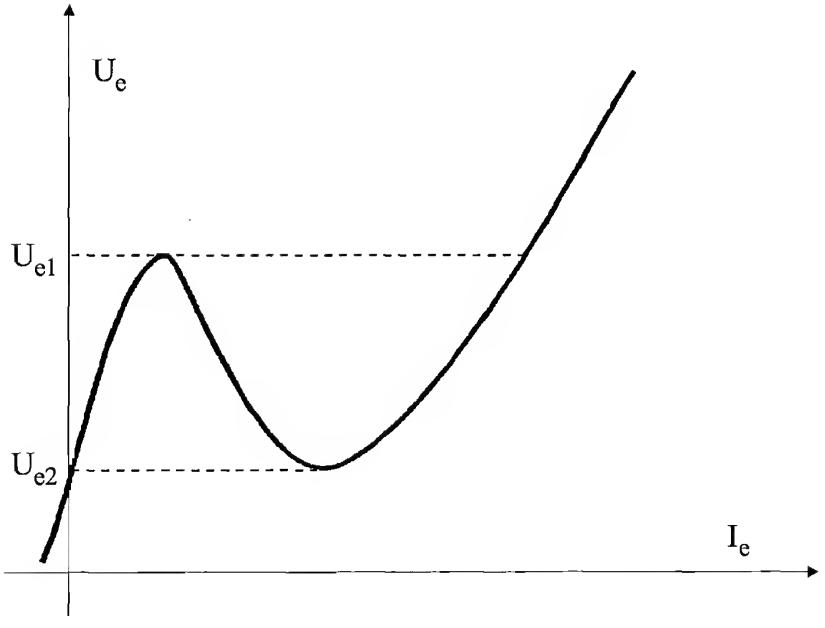


FIG. 12B

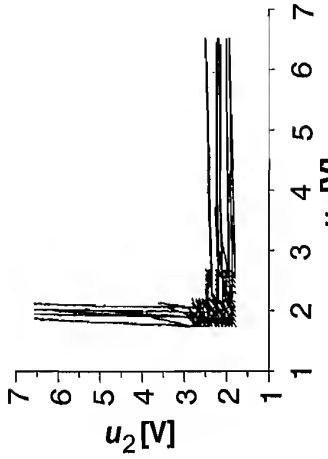


FIG. 13B

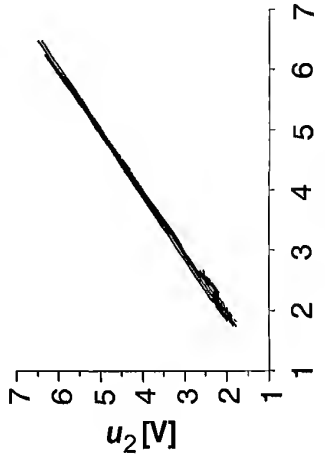


FIG. 13D

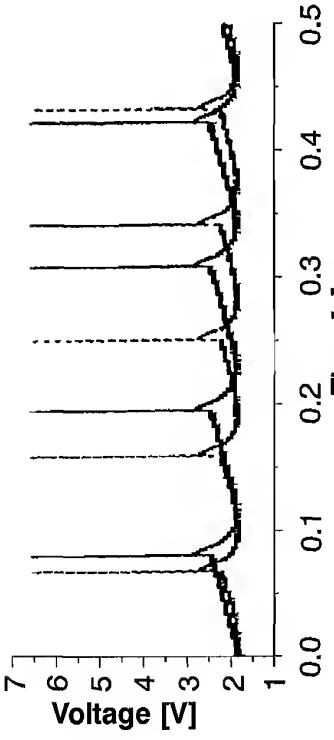


FIG. 13A

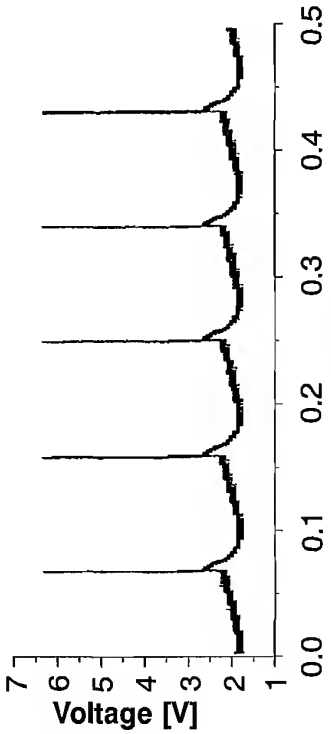
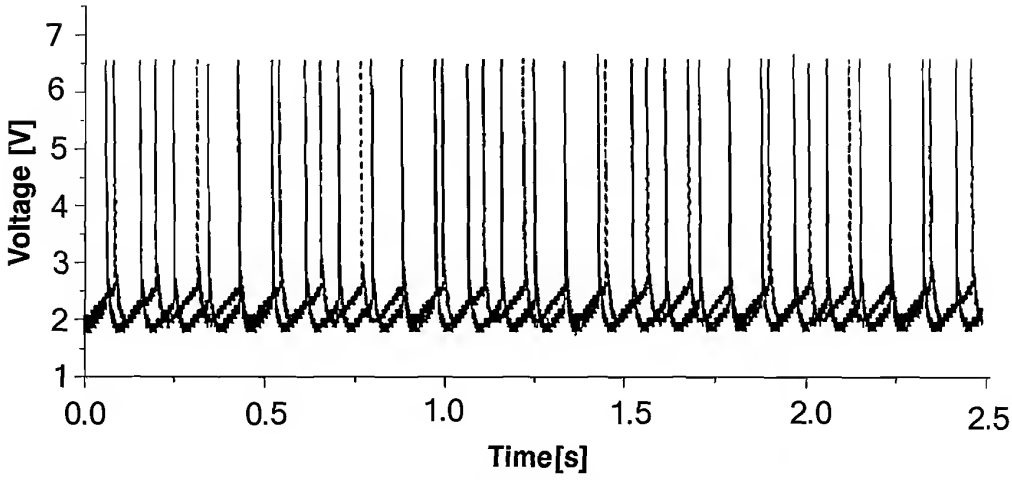
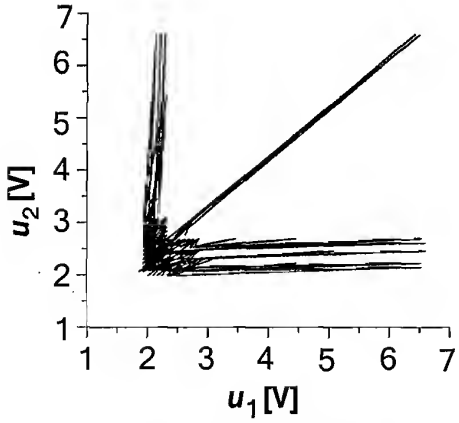


FIG. 13C



Synchronous and Asynchronous Spiking

FIG. 14A



Synchronous and Asynchronous Spiking

FIG. 14B

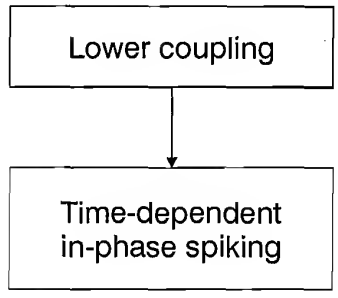


FIG. 14C

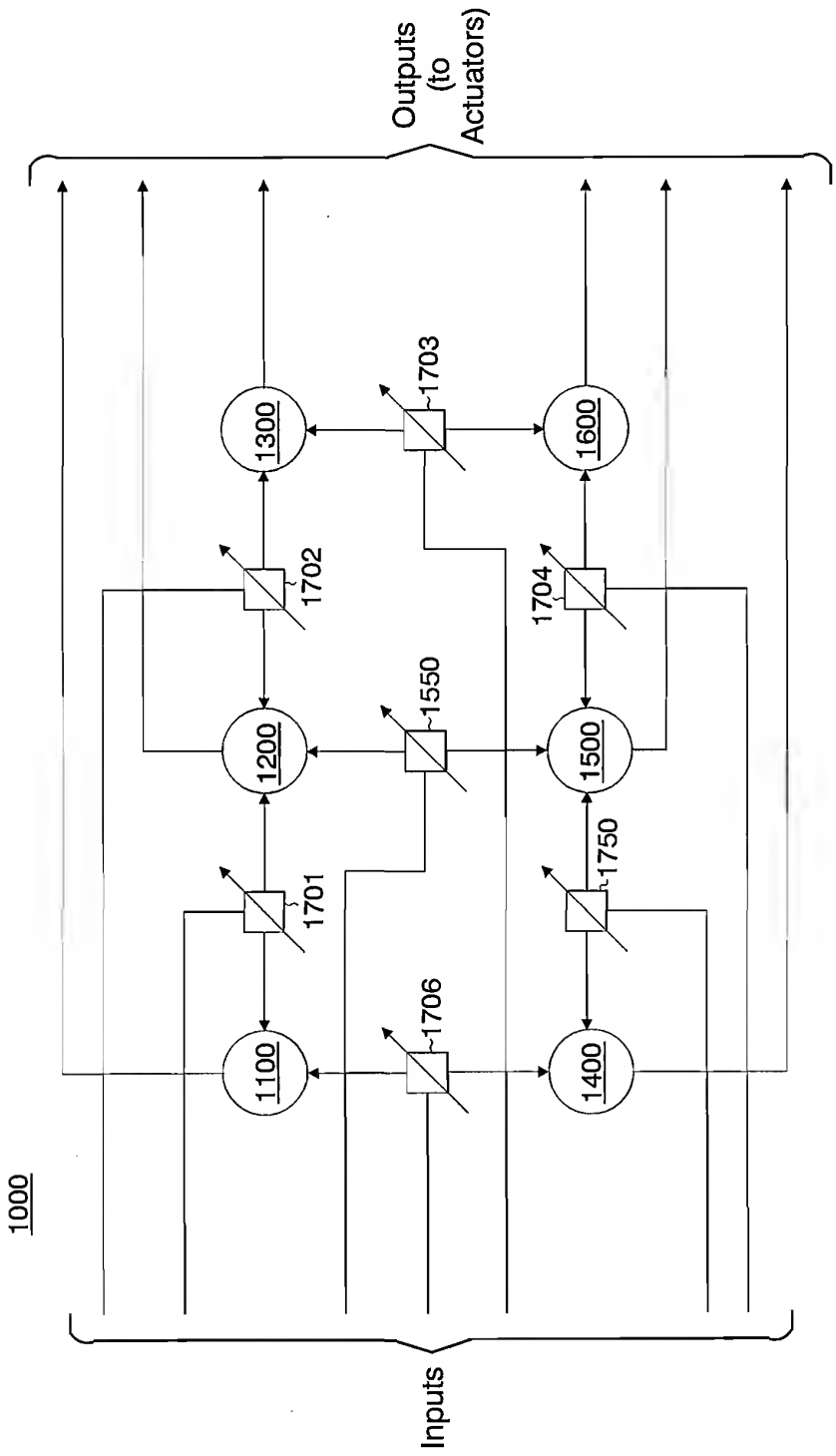

Outputs (to Actuators)
1300
1703
1600
1702
1704
1200
1550
1500
1701
1750
1706
1100
1400
1000
Inputs

FIG. 15

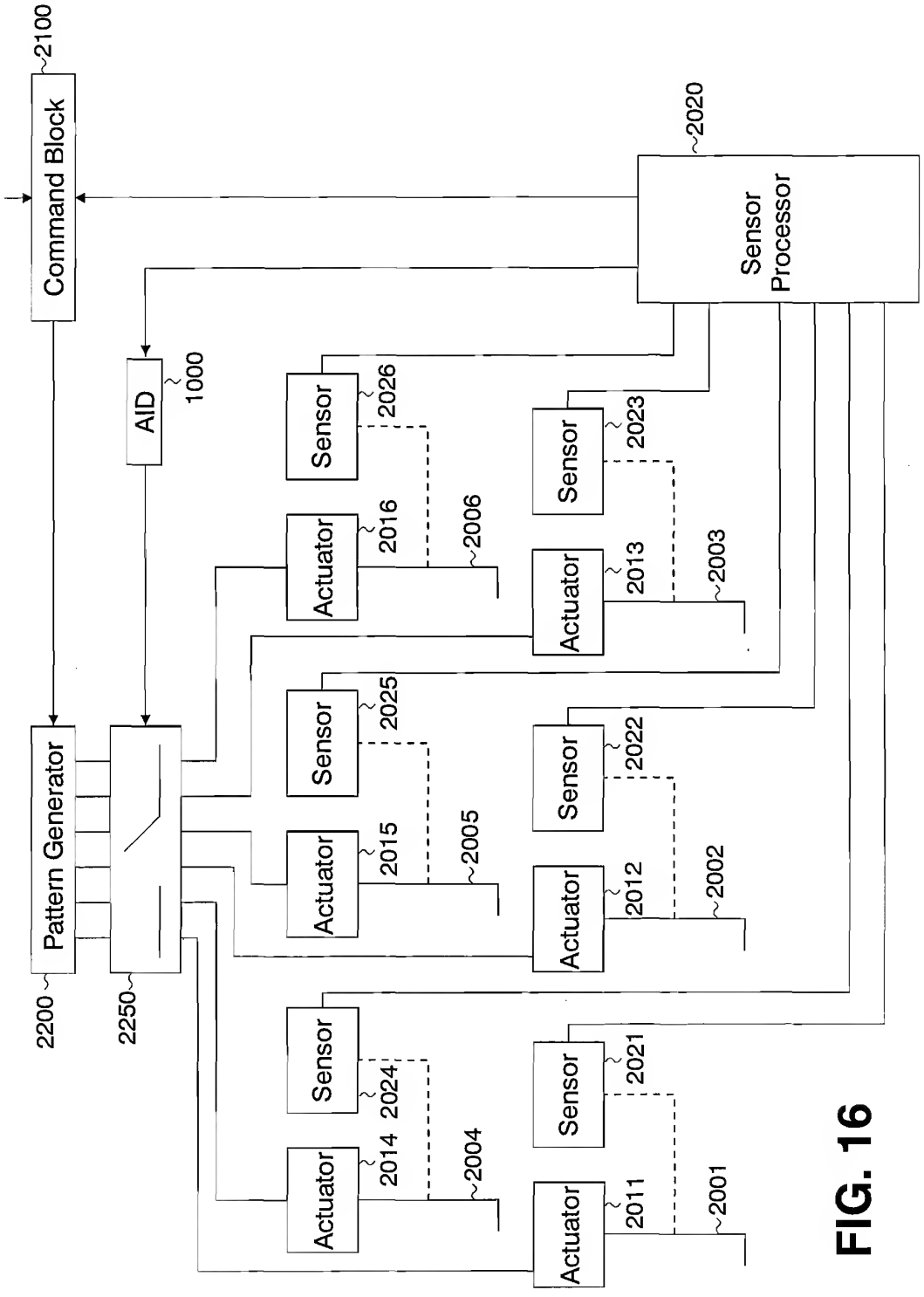

2100
Command Block
2020
Sensor Processor
AID
1000
Sensor
2026
Actuator
2016
2006
Sensor
2023
Actuator
2013
2003
Sensor
2025
Actuator
2015
2005
Sensor
2022
Actuator
2012
2002
Sensor
2024
Actuator
2014
2004
Sensor
2021
Actuator
2011
2001
Pattern Generator
2200
2250

FIG. 16

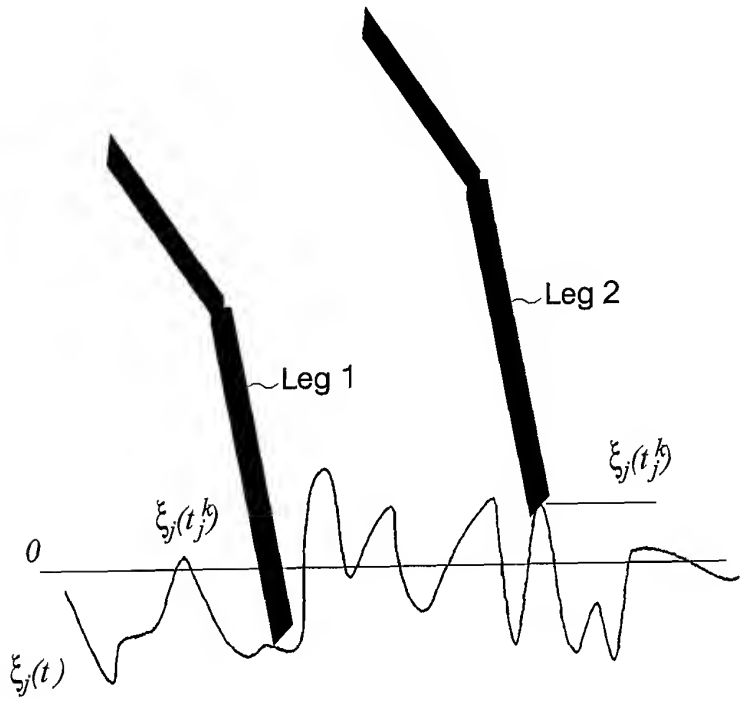


FIG. 17

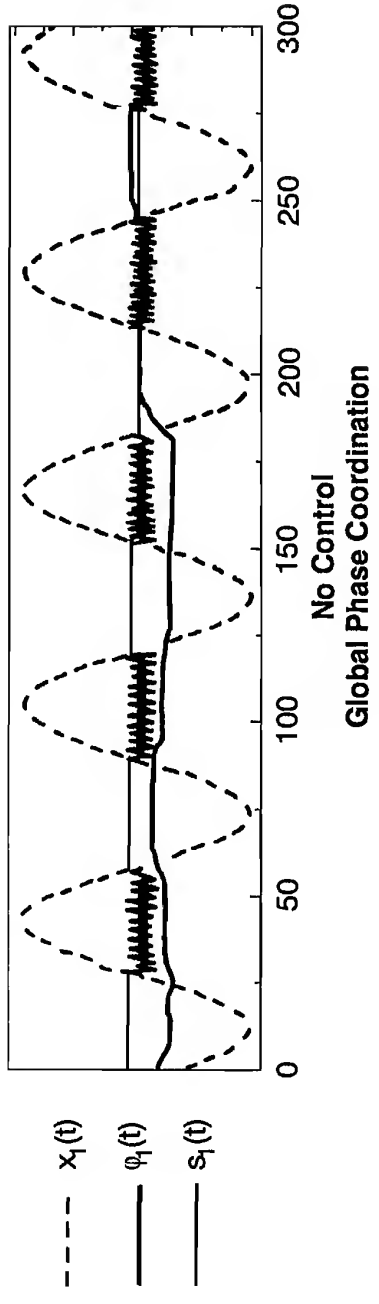


FIG. 18A

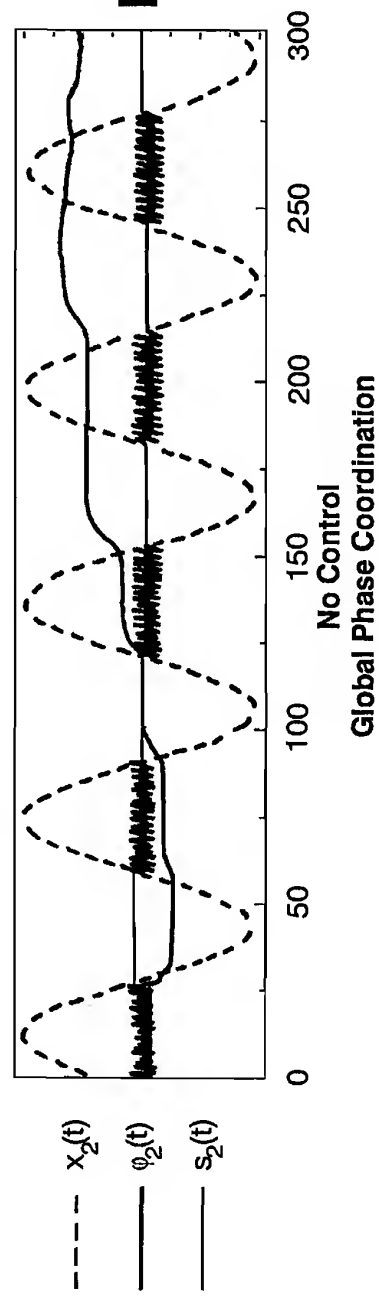


FIG. 18B

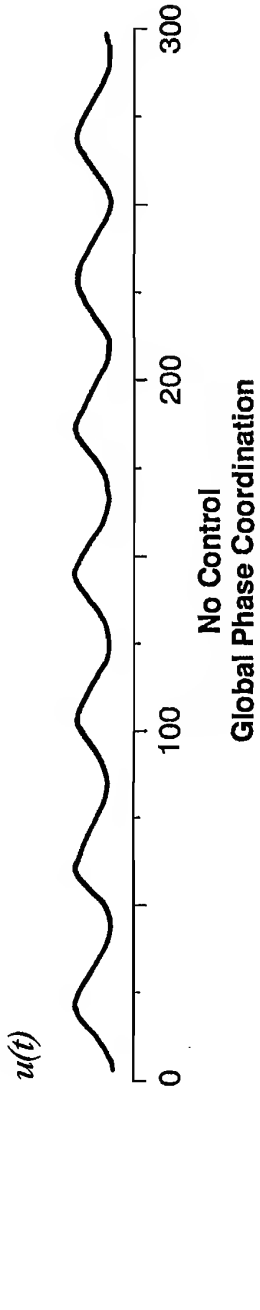
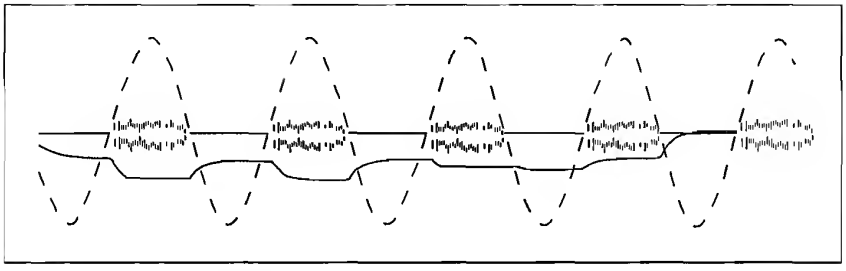


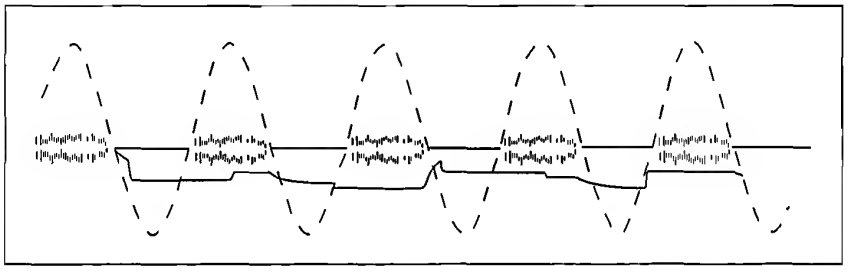
FIG. 18C

The control signal recovers the correct phase shift relations



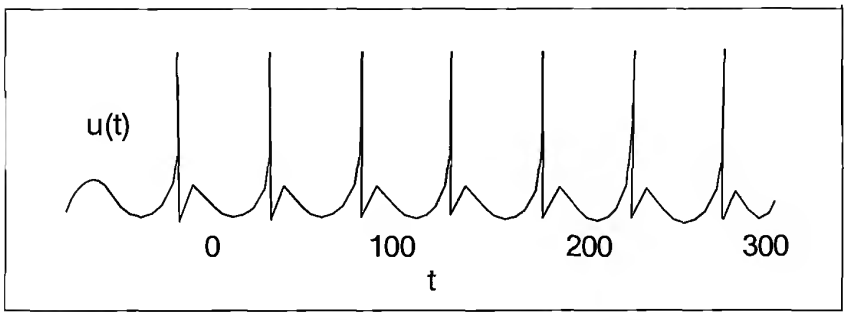
Coordination with Discrete Control

FIG. 19A



Coordination with Discrete Control

FIG. 19B

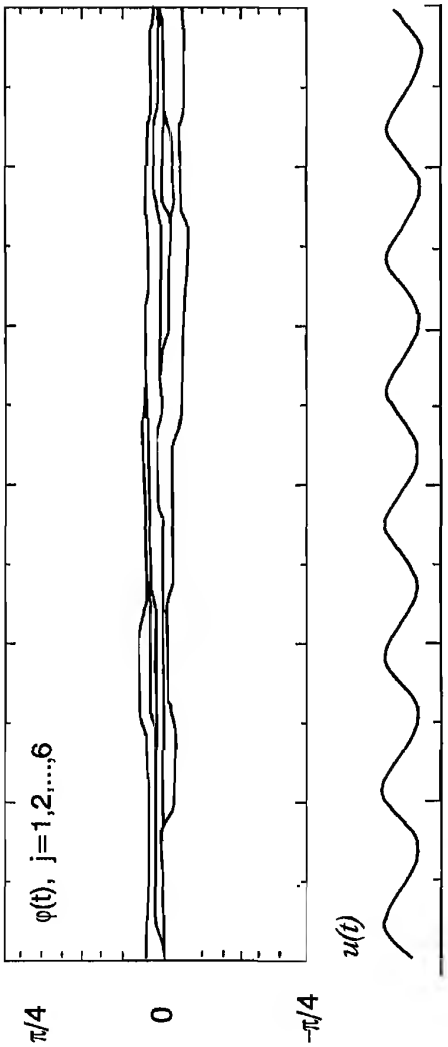


Coordination with Discrete Control

FIG. 19C

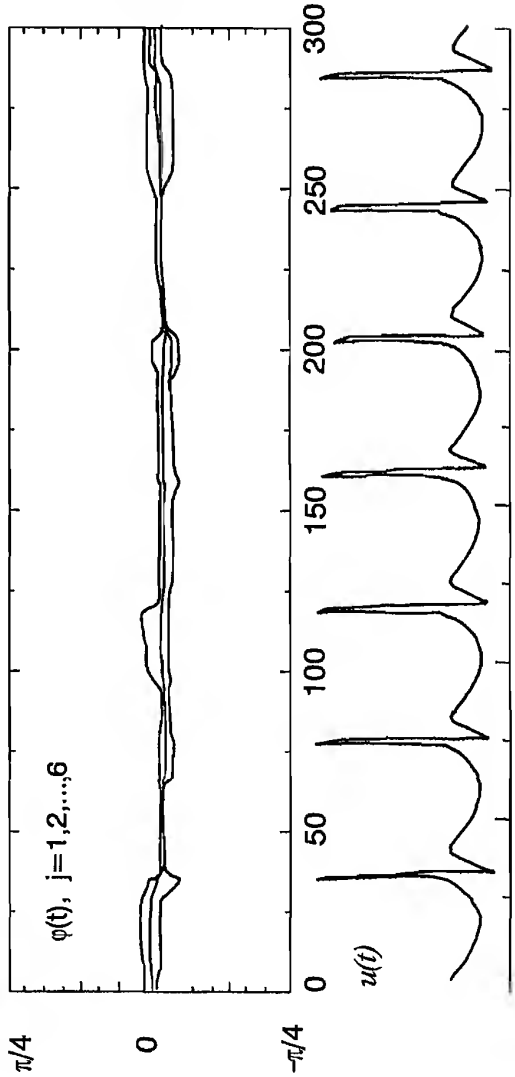
No Control

FIG. 20A



Discrete Control

FIG. 20B



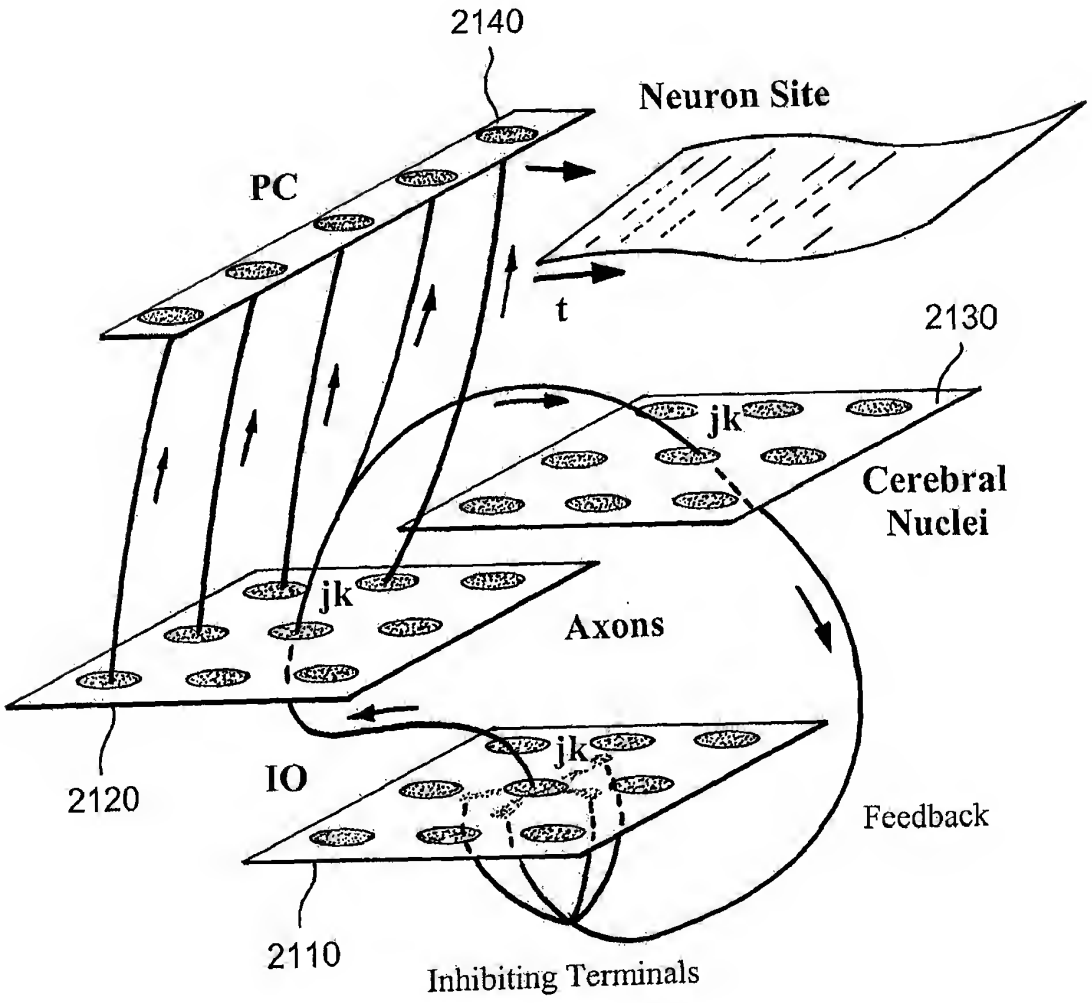

2140
Neuron Site
PC
t
2130
jk
Cerebral
Nuclei
jk
Axons
jk
IO
2120
Feedback
2110
Inhibiting Terminals

FIG. 21

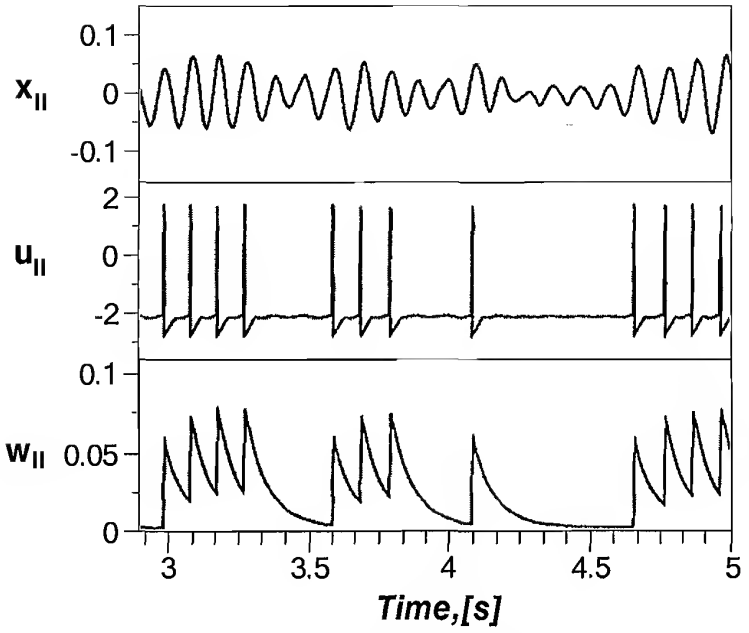


FIG. 22A

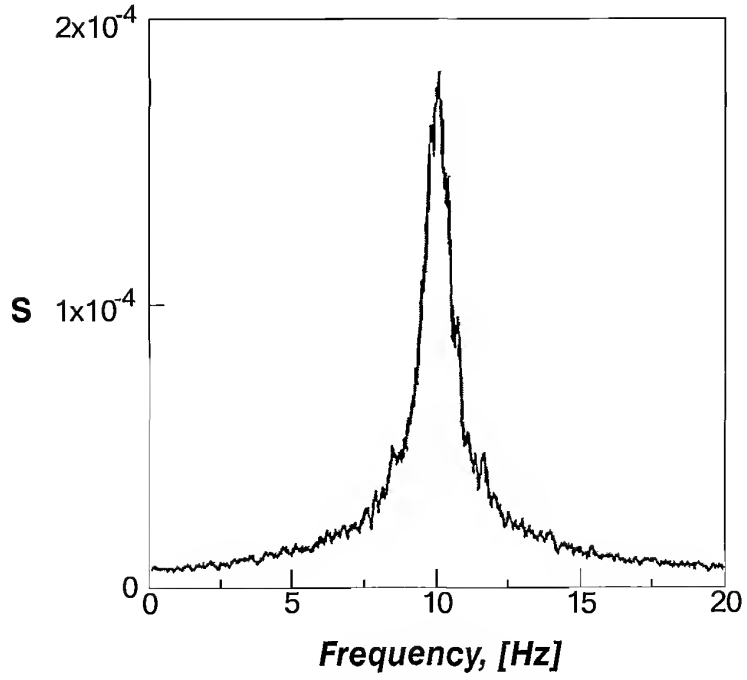


FIG. 22B

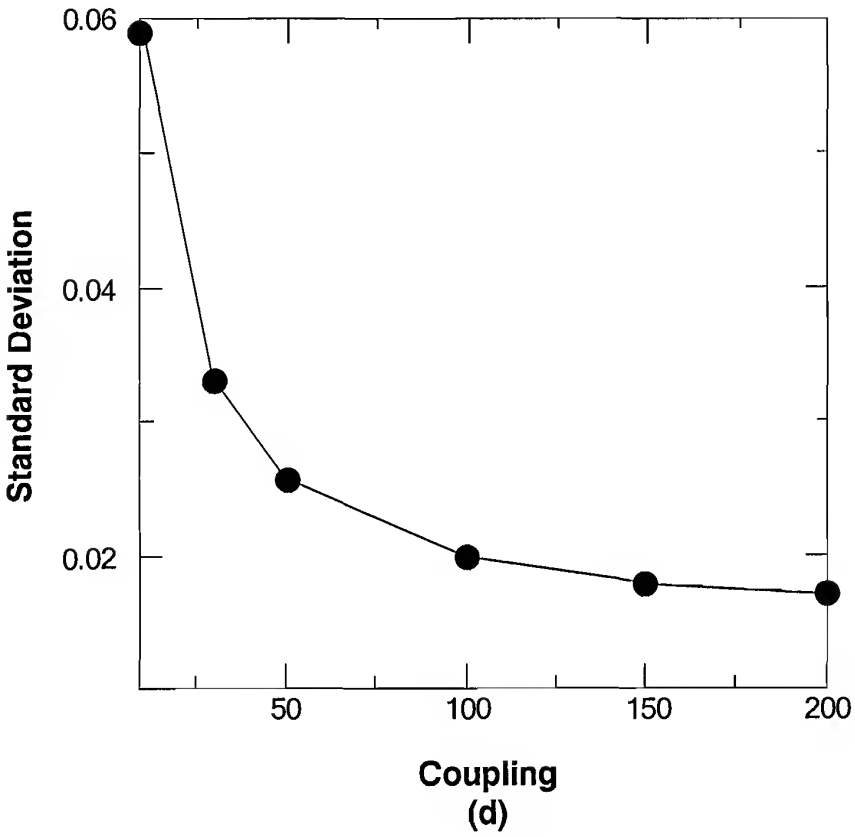
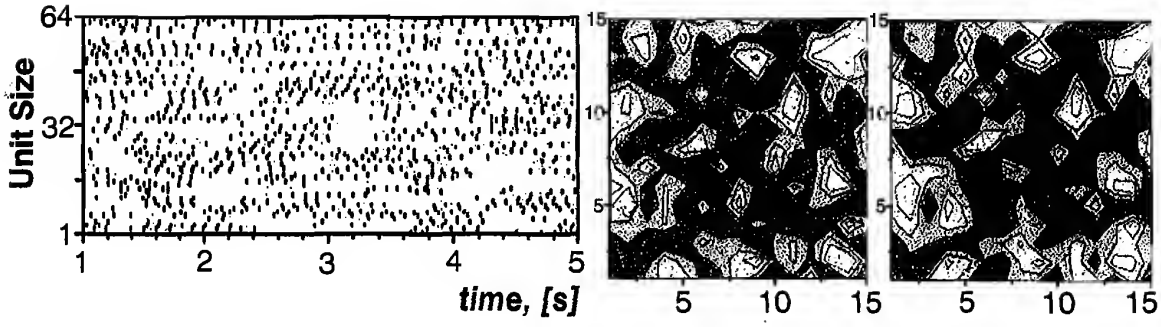
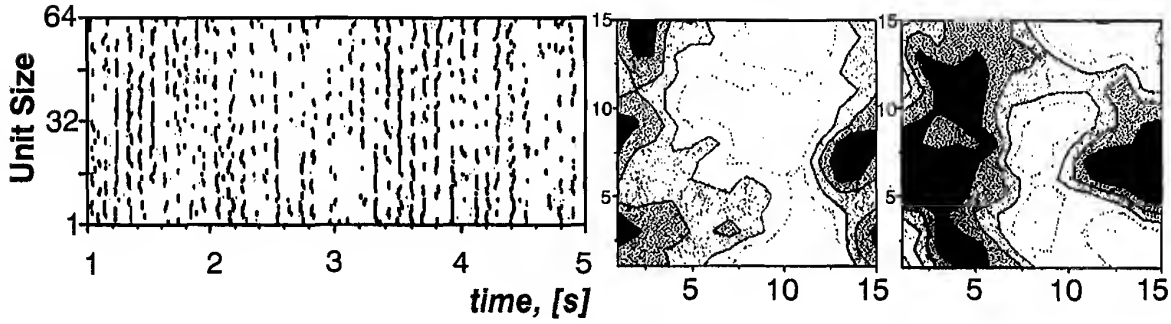


FIG. 23



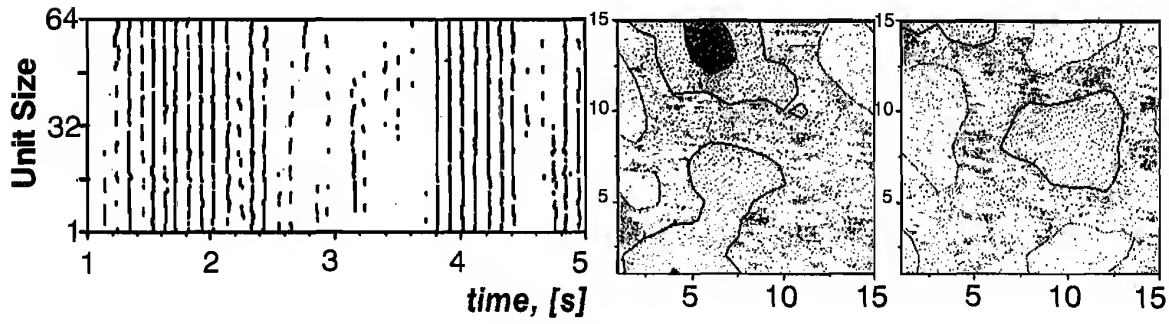
d=0

FIG. 24A



d=50

FIG. 24B



d=200

FIG. 24C

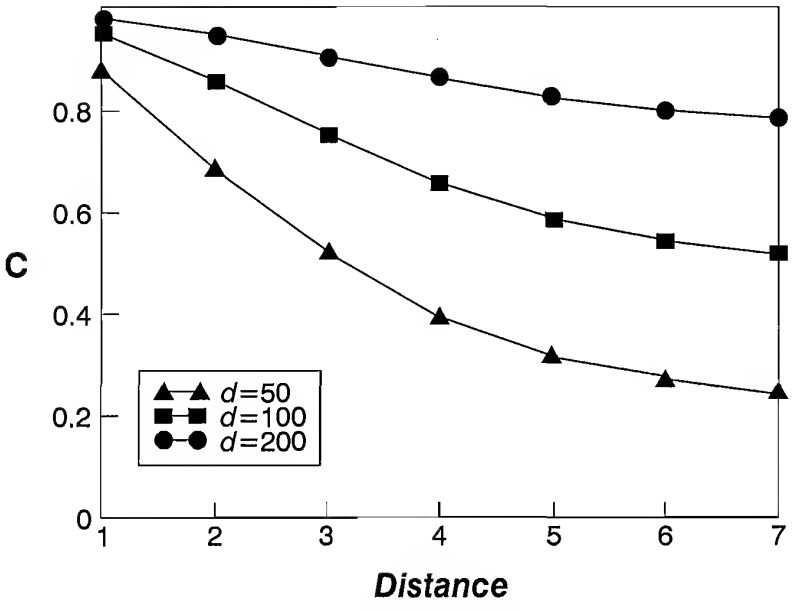


FIG. 25A

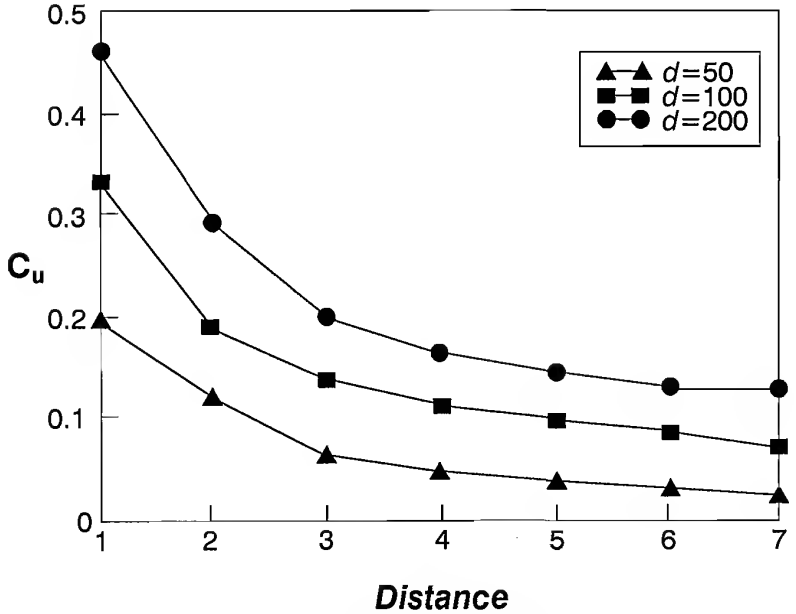


FIG. 25B

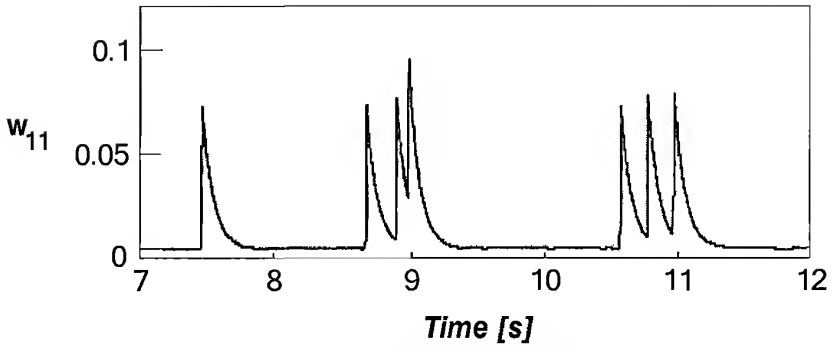


FIG. 26A

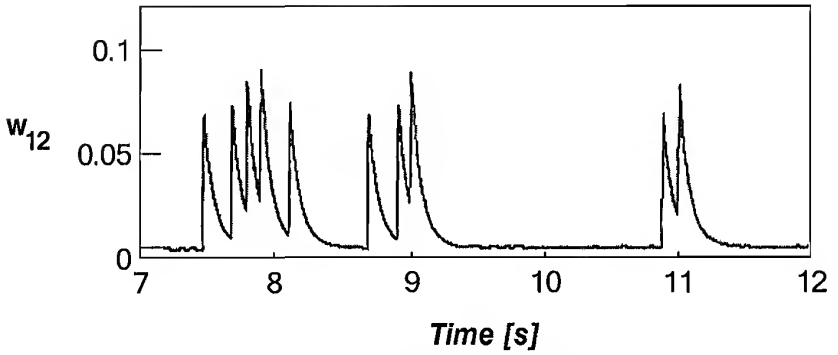


FIG. 26B

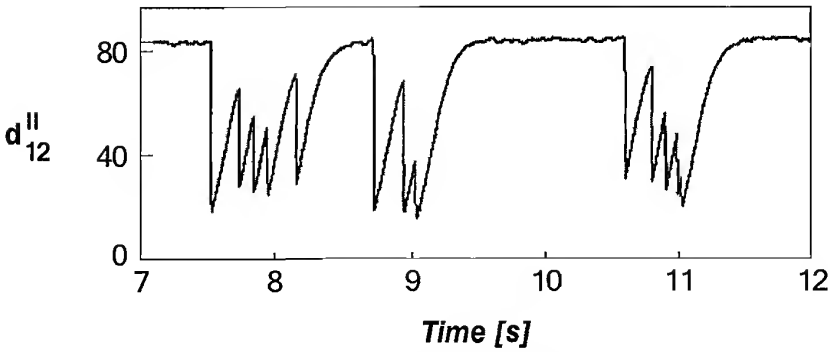


FIG. 26C

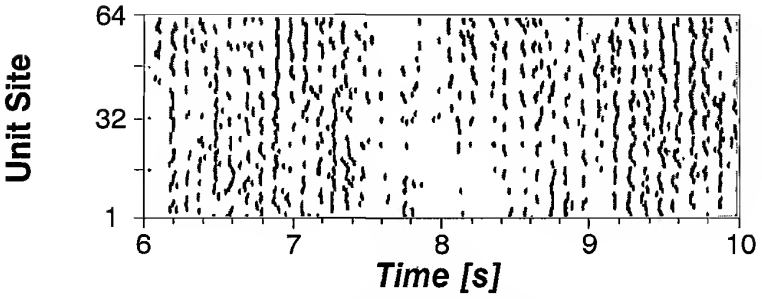


FIG. 27A

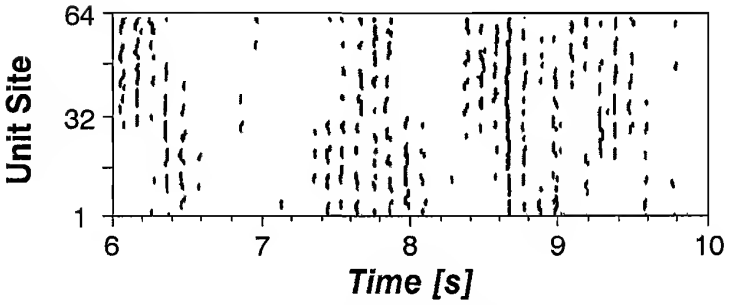


FIG. 27B

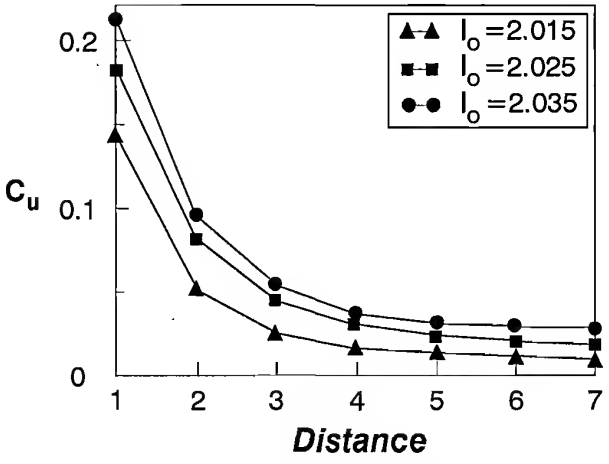


FIG. 27C

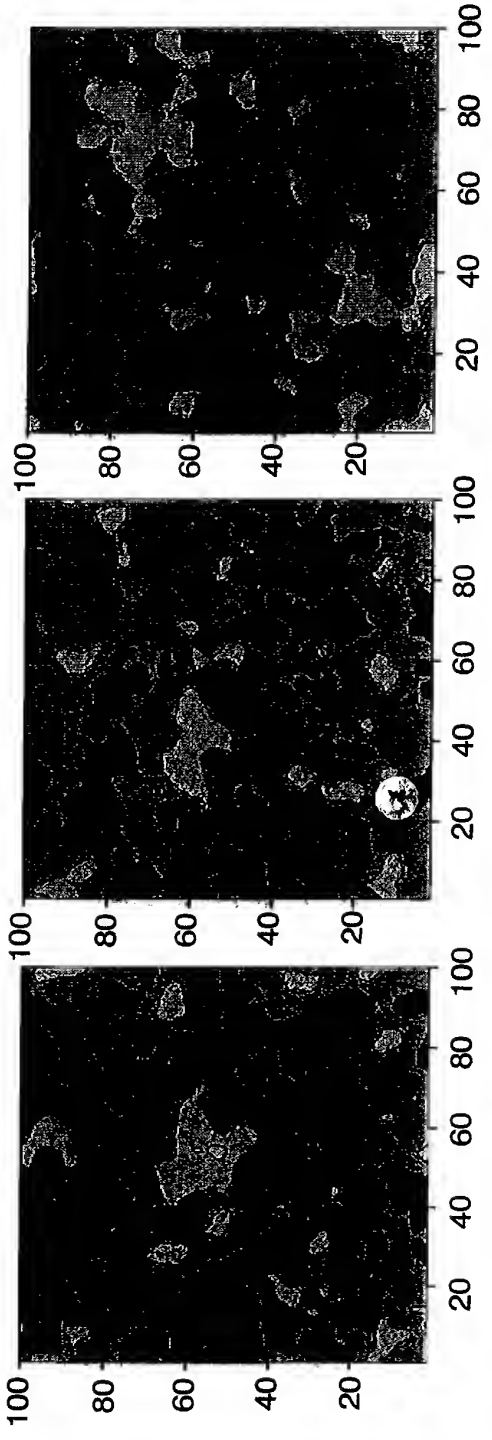


FIG. 28A

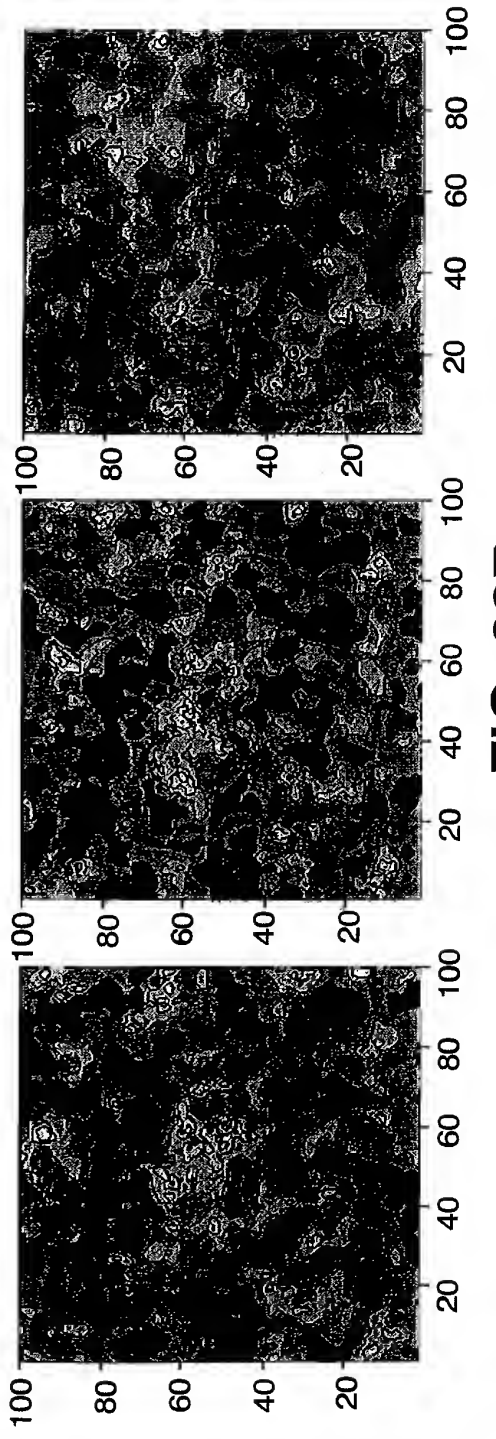


FIG. 28B

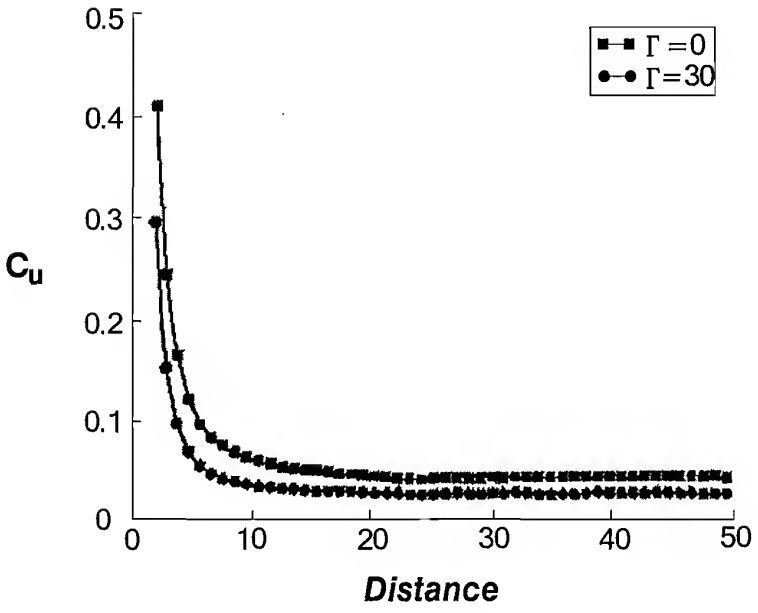


FIG. 29A

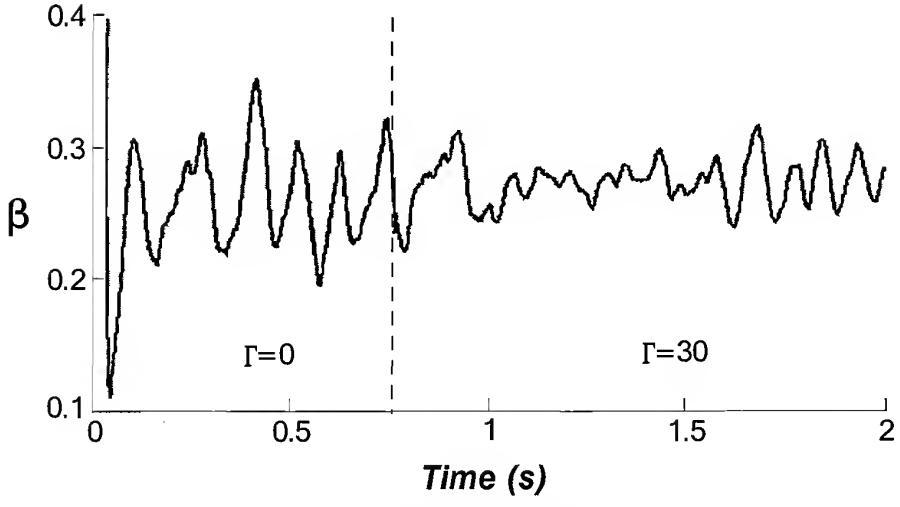


FIG. 29B

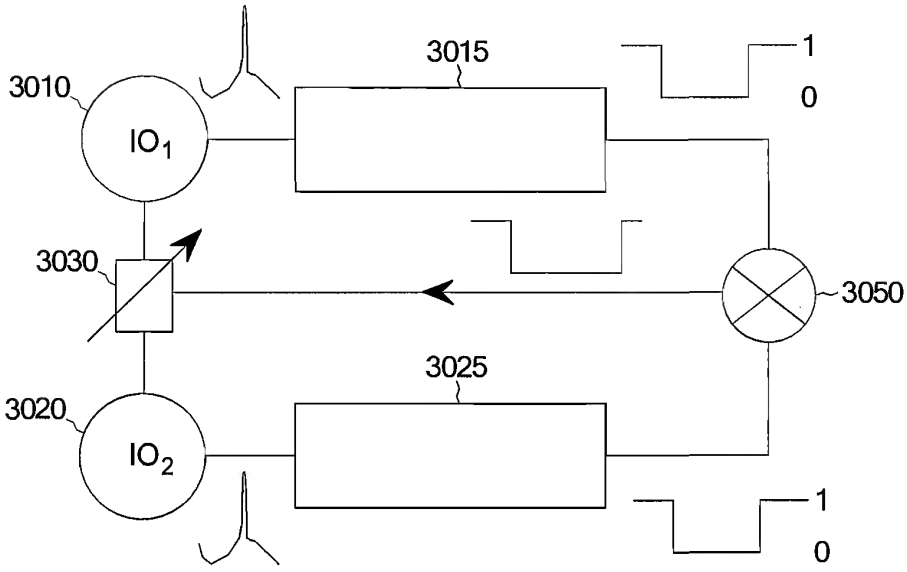


FIG. 30A

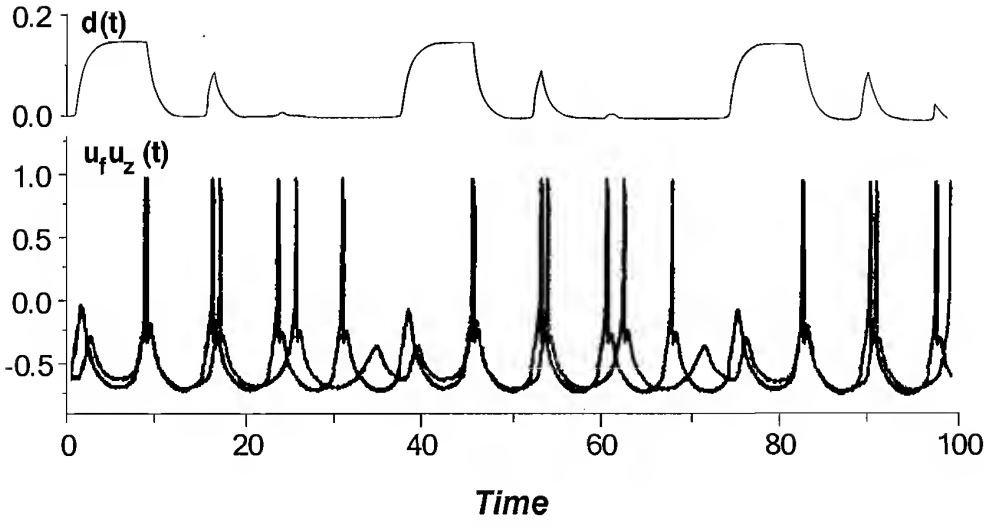
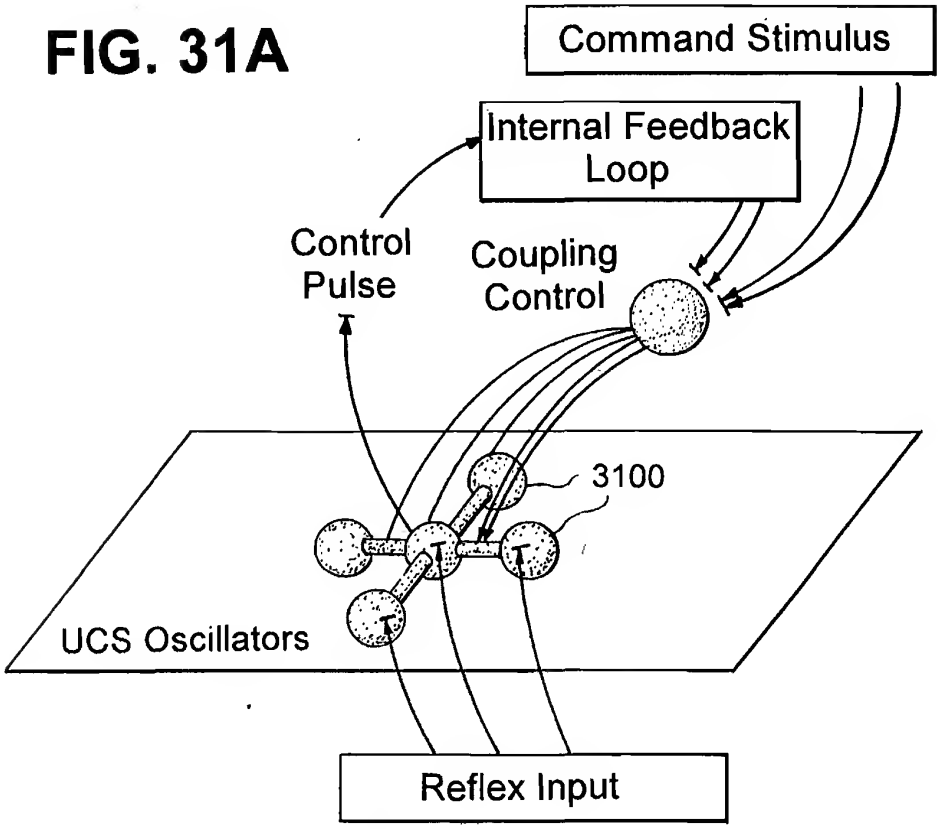
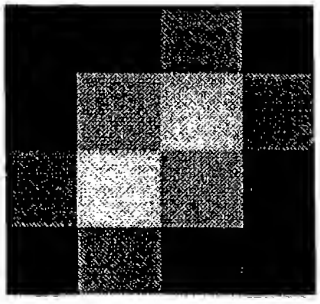


FIG. 30B

FIG. 31A





Motor Pattern

FIG. 31B

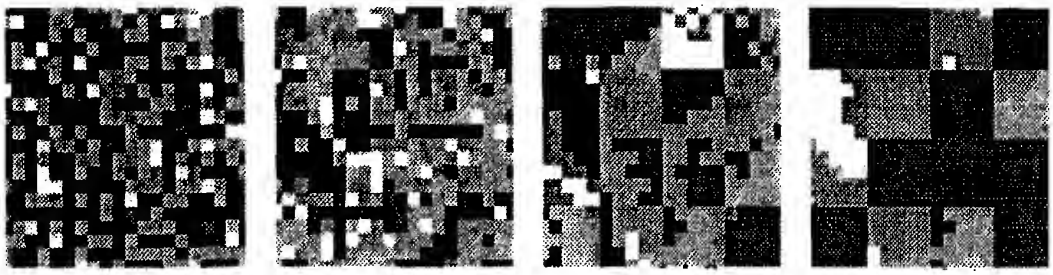


FIG. 32A

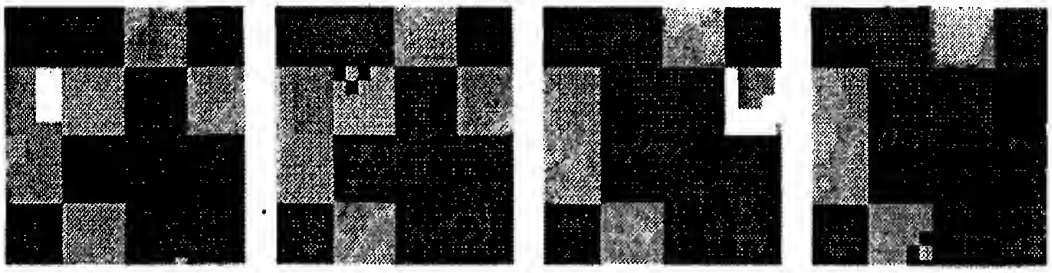


FIG. 32B

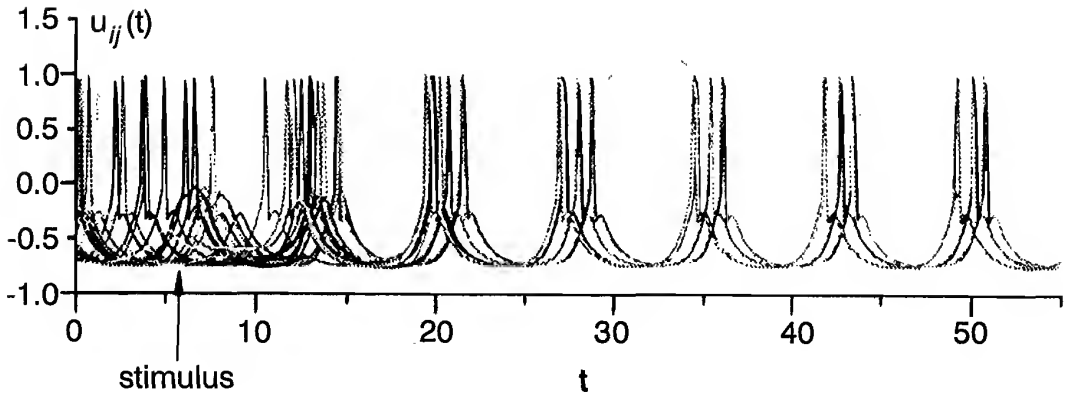


FIG. 32C

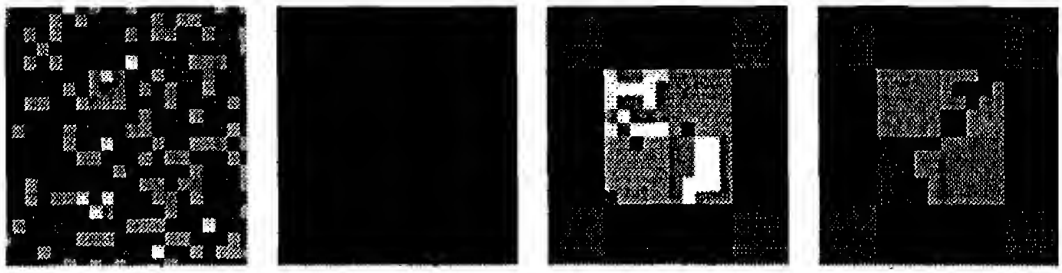


FIG. 33A

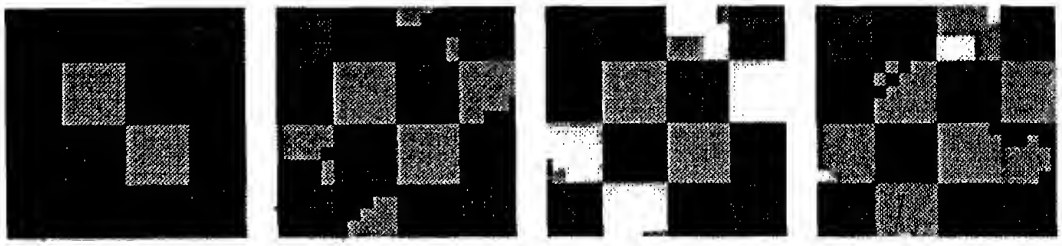


FIG. 33B

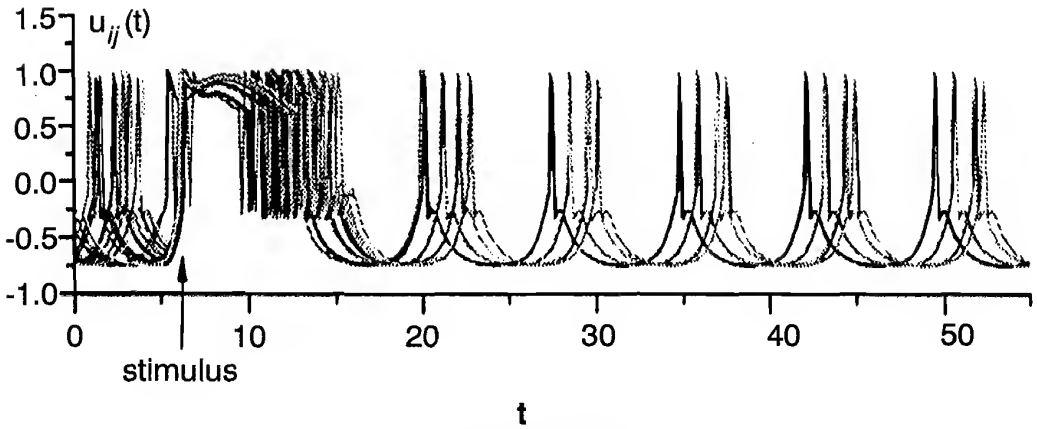


FIG. 33C